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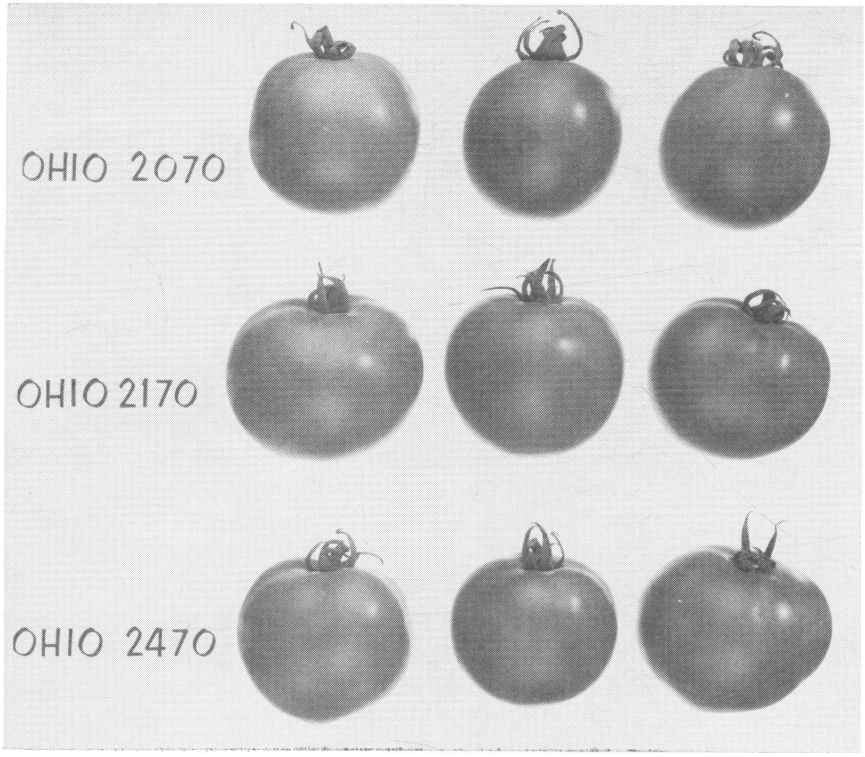

OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
WOOSTER, OHIO

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S. Z. BERRY and W. A. GOULD

The new processing tomato cultivars Ohio 2070, Ohio 2170, and Ohio 2470 are the result of a program designed to aid whole-pack processors and growers. These whole-pack canners have been handicapped by a limited choice of suitable cultivars.

The new cultivars possess a range of earliness allowing the utilization of more efficient production systems. They are productive and suitable for hand or mechanical harvest. In addition to their excellent field performance, these new cultivars possess desirable fruit quality characteristics which are particularly useful to the whole-pack canner.

Breeding and selection were carried out in Ohio and development was accelerated through winter nurseries in Florida. Testing was carried out at the OARDC Northwestern Branch near Custar, The Ohio State University at Columbus, and in several Ohio production areas. In tests at Custar and grower trials at St. Henry and Toledo, Ohio, these lines exhibited earliness and productivity comparable to C28 and Chico III (Tables 1 and 2). Fruit size, concentration, uniformity of ripening, and suitability for hand or mechanical harvesting were likewise satisfactory. Preliminary reports from workers in the Midwest, East, and Canada have indicated that these new cultivars have good adaptability.

Vines of the cultivars are vigorous, medium-small in size, determinate, and adapted to high population direct-seed or transplant culture. The cultivars are resistant to Race 1 of *Fusarium oxysporum* f. *lycopersici* and exhibit a high level of field tolerance to Verticillium wilt. Adequate foliage cover enables good quality fruit development, yet the vines become uniformly prostrate at maturity which facilitates hand or machine harvesting. The small-vined, more concentrated, and earliest maturing Ohio 2070 and Ohio 2170, however, may tend to have fruit exposure under poor cultural conditions. Good resistance to radial and concentric fruit cracking, along with firmness, enable field storage of fruit on the vine for extended periods and allow once-over harvest.

In general, the raw and processed fruit quality characteristics of these new Ohio cultivars has been good. Commercially processed lots

from locations indicate that the cultivars are particularly promising for utilization in whole-pack production. The quality and USDA grade characteristics are summarized in Tables 3 and 4 for fruit from OARDC, Custar, and grower trials at Tipp City, St. Henry, and Toledo, Ohio.

TABLE 1.—Performance in Mechanically Harvested Trials of Ohio 2070, 2170, and 2470 in Comparison with Chico III and C28. OARDC Northwestern Branch, Custar, Ohio, 1970, 1971, and 1972.

Cultivar	Harvest Day	Ripe Useable Fruit Tons per Acre	Percent Useable Ripe Fruit	Percent Ripe Broken Fruit	Fruit Size (Ounces per Fruit)
		1970			
Ohio 2070	8/31	22.3	88	4	3.6
Ohio 2170	9/2	21.6	88	3	3.6
Ohio 2470	9/8	21.8	88	15	4.0
C28	9/8	20.0	88	14	4.8
Chico III	9/2	23.0	88	3	1.9
		1971			
Ohio 2070	9/1	14.9	91	6	2.9
Ohio 2170	9/1	12.5	91	7	2.8
Ohio 2470	9/14	15.2	87	8	3.0
C28	9/14	14.4	85	7	3.5
Chico III	9/14	16.9	89	7	1.6
		1972			
Ohio 2070	9/5	20.7	82	11	
Ohio 2170	9/5	17.4	78	10	
Ohio 2470	9/5	20.3	77	6	
C28	9/5	22.2	79	11	
Chico III	9/5	21.5	76	5	

TABLE 2.—Performance in Simulated Mechanical Harvest by Once-over Hand-pick of Ohio 2070, 2170, and 2470 in Comparison with C28. Grower Trials, St. Henry and Toledo, Ohio, 1972.

Cultivar	Ripe Useable Fruit, Tons per Acre	
	St. Henry Sept. 13	Toledo Sept. 21
Ohio 2070	14.4	18.0
Ohio 2170	16.7	18.5
Ohio 2470	18.8	19.3
C28	14.8	19.2

TABLE 3.—Raw Product Quality, Machine-Harvested. OARDC Northwestern Branch, Custar, Ohio, 1972.

	USDA Grade in Percent				Objective Quality Attributes			
Cultivar	No. 1	No. 2C	No. 2D	Culls	Hunter a/b	pH	Total Acid	Oz. per Fruit
Ohio 2070	68.5	15.5	8	8	2.71	4.50	0.35	3.4
Ohio 2170	70.0	16.0	7	7	2.65	4.50	0.37	3.3
Ohio 2470	55.0	31.0	6	8	2.62	4.55	0.32	3.6
C28	61.0	26.0	6	7	2.19	4.45	0.42	4.1

TABLE 4.—Average Quality Values of In-plant Processed Whole-Pack Tomatoes from Grower Trials at Tipp City, St. Henry, and Toledo, Ohio, 1972.

	USDA Grade						Objective Quality Attributes		
Cultivar	Dried Wt.	Wholeness	Color	Defects	Total Score	Grade	pH	Total Acid	Soluble Solids
Ohio 2070	16.5	18.1	26.7	30	91.5	B	4.45	0.34	5.95
Ohio 2170	16.5	18.2	26.0	30	90.7	B	4.44	0.32	5.70
Ohio 2470	18.5	17.4	26.1	30	92.0	B	4.44	0.32	5.68
C28	16.8	18.1	26.9	30	91.8	B	4.41	0.36	5.88

The identifying features of Ohio 2070, 2170 and 2470 are summarized as follows:

CULTIVAR OHIO 2070

Parentage—C28 x VF99
Maturity—early
Vine—determinate (*sp*), short intermodes
Vine size—small to medium, prostrate, and compact
Fruit concentration—excellent
Fruit shape—round oblate, medium stem and stylar scar
Fruit size—2¾ to 3¾ oz. per fruit
Fruit cracking—good resistance
Fruit color—uniform ripening and ripens to good color, particularly as related to peeled product
Disease resistance—Race 1 of *Fusarium oxysporum* f. *lycopersici*
Harvest—once-over hand or mechanical harvest
Processing quality—good, must be cored but exhibits good adaptability to processing as whole-pack

CULTIVAR OHIO 2170

Parentage—C28 x Heinz 1630
Maturity—early
Vine—determinate (*sp*), short internodes
Vine size—small to medium, prostrate, and compact
Fruit concentration—excellent
Fruit shape—round, medium stem scar, and small stylar scar
Fruit size—2¾ to 3¾ oz. per fruit
Fruit cracking—good resistance
Fruit color—uniform ripening and ripens to excellent color, particularly as related to peeled product
Disease resistance—Race 1 of *Fusarium oxysporum* f. *lycopersici*
Harvest—once-over hand or mechanical harvest
Processing quality—good, must be cored but exhibits good adaptability to processing as whole-pack

CULTIVAR OHIO 2470

Parentage—C28 x Cold Set
Maturity—early - midseason
Vine—determinate (*sp*), short internodes
Vine size—medium, semi-prostrate
Fruit concentration—good with high yield potential
Fruit shape—round, medium stem scar, small stylar scar with tendency to pointed blossom end.

Fruit size—3 to 4 oz. per fruit
Fruit cracking—good resistance
Fruit color—uniform ripening and ripens to good color, particularly as related to peeled product
Disease resistance—Race 1 of *Fusarium oxysporum* f. *lycopersici*
Harvest—once-over hand or mechanical harvest
Processing quality—excellent, must be cored but exhibits good adaptability to processing as whole-pack

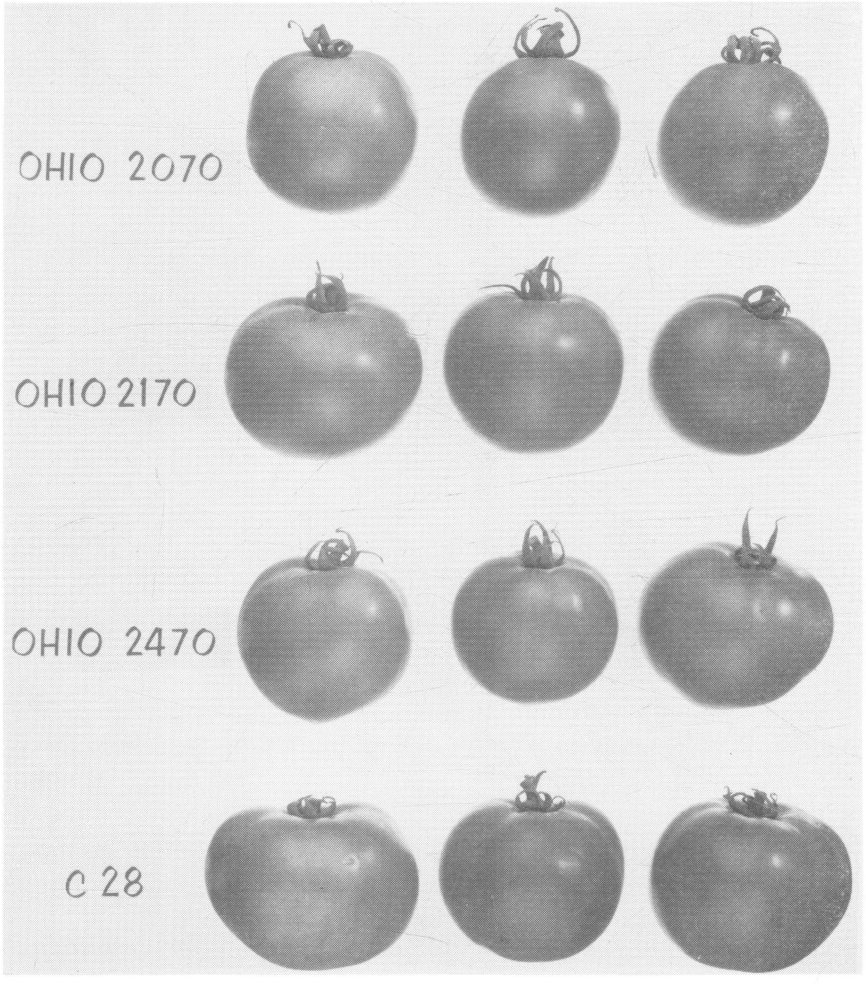

FIG. 1.—Comparison of side view of mature fruits of Ohio 2070, Ohio 2170, Ohio 2470, and C28.

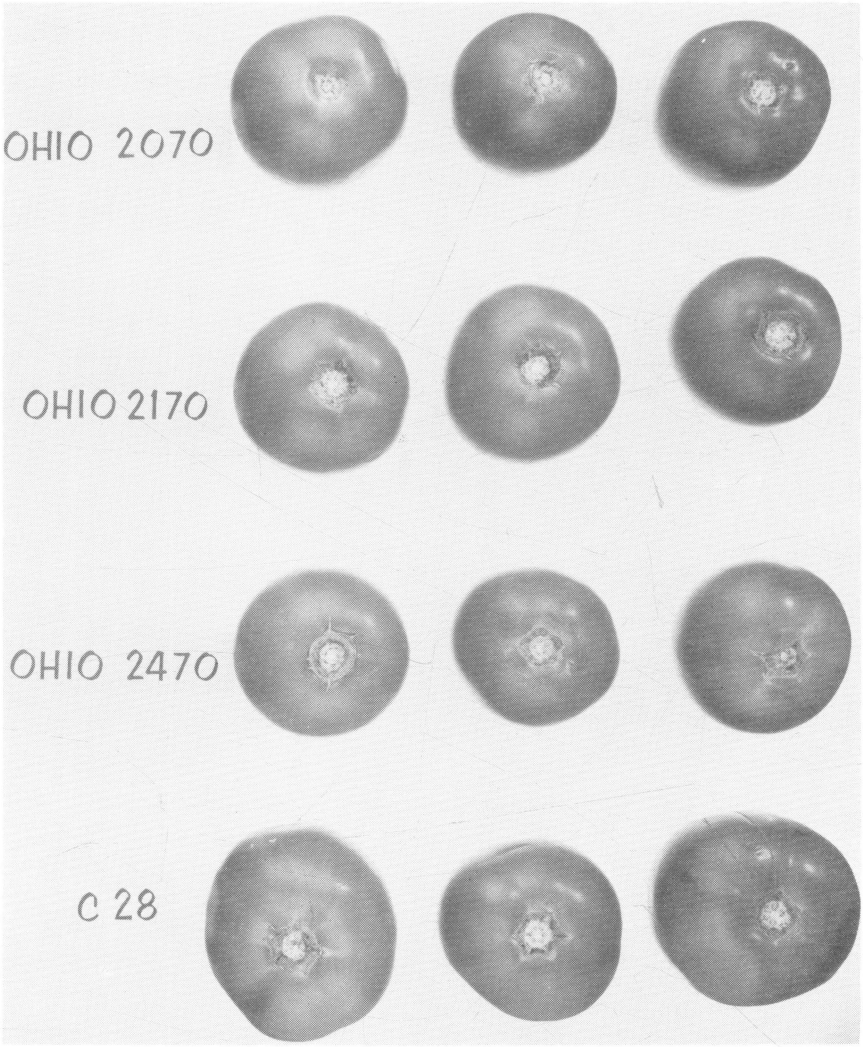

FIG. 2.—Comparision of stem end of mature fruits of Ohio 2070, Ohio 2170, Ohio 2470, and C28.

FIG. 3.—Cross sections of mature fruits of Ohio 2070, Ohio 2170, Ohio 2470, and C28.

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Ohio's major soil types and climatic conditions are represented at the Research Center's 13 locations. Thus, Center scientists can make field tests under conditions similar to those encountered by Ohio farmers.

Research is conducted by 15 departments on more than 6500 acres at Center headquarters in Wooster, nine branches, Green Springs Crops Research Unit, Pomerene Forest Laboratory, and The Ohio State University.

Center Headquarters, Wooster, Wayne County: 1953 acres

Eastern Ohio Resource Development Center, Caldwell, Noble County: 2053 acres

Green Springs Crops Research Unit, Green Springs, Sandusky County: 26 acres

Jackson Branch, Jackson, Jackson County: 344 acres

Mahoning County Farm, Canfield: 275 acres

Muck Crops Branch, Willard, Huron County: 15 acres

North Central Branch, Vickery, Erie County: 335 acres

Northwestern Branch, Hoytville, Wood County: 247 acres

Pomerene Forest Laboratory, Keene Township, Coshocton County: 227 acres

Southeastern Branch, Carpenter, Meigs County: 330 acres

Southern Branch, Ripley, Brown County: 275 acres

Western Branch, South Charleston, Clark County: 428 acres